

## COCAINE IN INTRA-NASAL SURGERY.

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ON the receipt of the intelligence of Koller's experiments<sup>1</sup> with cocaine, through Dr. Noyes' communication to *THE MEDICAL RECORD*, the first thought was naturally one suggestive of startling possibilities corresponding in direction with the reader's line of inquiry. In response to this impulse I have conducted a series of experiments with the new anæsthetic in operations upon the nares, and in view of the remarkable and positive character of the results obtained feel encouraged to relate my experience, with certain additional corroborative testimony.

My first experiments, conducted several weeks since with a two per cent. solution of the salt, were not extended on account of the unfavorable impression received. Though sceptical regarding the action of this solution for my purposes, I was nevertheless inclined to expect better results from a stronger preparation. A four per cent. solution of the crystalline hydrochlorate of cocaine was afterward obtained from a different source. My method of applying the salt consisted in placing pledgets of absorbent cotton in contact with the structures requiring removal, and projecting upon them, by means of a glass tube, from five to ten drops of the cocaine fluid. The cotton once moistened can be used several times at a single sitting; indeed cotton saturated with the fluid and afterward dried will remain cocainized for many hours. I employ an exceedingly fine home-made spray to produce more extensive effects.

The cases reported have been selected on account of the exaggerated sensibility of the structures involved, and as such offer excellent evidence of the powerful analgesic action of cocaine.

Mr. —, banker, consulted me on account of an annoying nasal catarrh. Examination revealed, among other things, a deviated septum pressing against a congestive hypertrophy of the left antero-inferior turbinated tissues. The deviated cartilage extended as a narrow horizontal ledge to the osseous edge of the septum, and obstructed nasal respiration through the left nostril. While employing a probe to point out the site of the affection, it happened to lightly touch the septum. The patient started as if severely injured, and invariably exhibited signs of intense discomfort. When the manipulation was repeated, intense sensitiveness was exhibited, and my prospects of assistance from the patient in a deliberate operation could hardly have been less favorable. A pledget of absorbent cotton was inserted in the nostril, against the abnormal structures, and a few drops of the cocaine fluid placed upon it by means of a camel's-hair brush. At the expiration of twenty minutes the cotton was removed. The first effect observed was the retreat of the lower turbinated tissue from contact with the septum, thus affording more room for operative manipulation. This peculiar action of the cocaine has already been described by Dr. Bosworth. I tentatively nipped off a piece of the septum with my fenestrated cartilage forceps; the procedure, according to the patient's statement, was perfectly painless. Emboldened by this I commenced work in earnest, the slight amount of bleeding enabling me to continue operating uninterruptedly for five minutes. During this interval the patient declared there was an entire absence of sensation. The parts were then cleansed of tissue debris. In five minutes sensation had returned. I reapplied the cocainized cotton, and after leaving it in five minutes, proceeded with the operation. In this interval I removed the whole length of the remaining deviated cartilage. The patient could with difficulty find words to express his profound sense of satisfaction.

Amanda D—, aged sixteen, referred to me by Dr. S. Hemingway. Congenital occlusion of the nares from

malformation of nasal and turbinated bones. Bridge of the nose almost entirely wanting. Interocular space very broad, falling of the lower jaws, with associated signs of habitual mouth-breathing. Both nostrils impacted with flesh-like masses, having almost the firmness and elasticity of rubber. The structures were jammed so tightly against the wall of the septum as to give at first sight the impression of its fusion with the cartilage. The turbinated tissues present none of the usual signs of hypertrophied membrane, having the appearance of slightly congested turbinated tissues, and having only a trifling tendency to retract when touched with cocaine. The tissues still possessed a sensibility evidently equalling that of the normal erectile structures. The posterior nares were obstructed. A case of congenital stenosis successfully treated by me several years since presented many features in common with this one.<sup>1</sup>

I had operated upon Amanda D— on a previous occasion, employing my transfixion needle and écraseur. The child did not possess a particle of fortitude, causing me a great deal of trouble by her persistent crying, and in spite of every precaution for her comfort she proved herself to be one of the most intractable patients I ever had to contend with. This state of hyperæsthesia was probably due to the prolonged contact of these delicate tissues with the septum narium. The case seemed an excellent one for the employment of cocaine. I therefore placed a pledget of absorbent cotton in the left nares, and moistened it with a few drops of the solution, carried into the nostril upon a camel's-hair brush. After the expiration of fifteen minutes I removed the cotton, and deliberately transfixed the pale tissues, the passage of the needle, as stated by the patient, causing absolutely no pain. The loop was likewise painlessly introduced, and the operation satisfactorily completed.

After an interval of five days I continued operating, replenishing my cocaine bottle from a neighboring druggist. The solution, though applied as in the first instance, did not have the desired effect. I then procured a fresh solution from still another druggist. This fluid likewise failed. Later in the day I procured some of the original preparation, and found it as effective as in the first instance. Small portions of the turbinated bodies were successfully removed by means of the fenestrated cartilage forceps, an expeditious but more painful and bloody method than excision with the wire, and therefore never employed by me for this purpose. The controlling influence of the cocaine over the blood supply removed this objectionable feature, and furnished a clear field for operation. As the incisions gradually included the deeper-lying tissues they became sensitive, requiring fresh applications of the cocainized cotton.

Mr. P—, merchant, thirty-two years of age, was seen by me in consultation with Dr. Bellows, of Brooklyn. The patient had been unable to breathe through the nose for fourteen months. The nostrils closed gradually, the right being the first to become involved.

Dr. Bellows informed me that he had already been in the hands of a physician, who employed the galvano-cautery for several weeks. A surgical procedure of a more formidable character was next employed, the patient emerging from etherization only to be confined to the house for three weeks on account of the severity of the operation, and an otitis media acuta set up by the traumatism. After recovering from these unfortunate sequelæ his condition was worse than before the operation. An examination showed the right nostril to be entirely occluded by a combined deviation of the septum and turbinated hypertrophy. A very narrow chink in the left nostril permitted the occasional entrance of a feeble current of air, enabling the patient to partially remove pent-up nasal secretions. It possessed, however, very little respiratory value.

I have been gradually clearing the nostrils for several

<sup>1</sup> Wiener Medizinische Wochenschrift, No. 44, 1884.<sup>1</sup> Archives of Laryngology, vol. iii., 1882.

weeks, removing small portions of the tissues in such way as not to interfere with the patient's business. Although the careful excision of small portions of bone and cartilage greatly diminished his suffering, there were, nevertheless, moments when he complained severely of the pain inflicted by the *rongeur* and cutting forceps. I employed cocaine by placing small bits of absorbent cotton in contact with the already wounded and tender surfaces, and dropping the solution upon it by means of a pipette. In thirty minutes the pledgets were removed and a tentative test made. Although the forceps inflicted pain, superficial sensation was reduced to a degree permitting the stripping off of membranes partly divided in a previous operation. Another application of cocaine was made, the cotton being again removed after an interval of fifteen minutes. I then commenced to divide the tissues, and was told to continue the operation, as no pain was inflicted. I continued operating for three minutes, when the patient interrupted me while cutting away the deeper structures over the vomer. In this interval bone and cartilage were alike divided without causing the slightest pain. This method of alternately benumbing and cutting was continued for more than two hours and a half, the patient being in the best of spirits during the entire interval. He left the office breathing through a free opening into the posterior nares, and thoroughly convinced of the pain-relieving properties of cocaine.

The following history, reported through the courtesy of Dr. William Vanderpoel, offers additional evidence in a case in which my *écraseur* was recommended: Mrs. Annie M—, aged twenty-nine years and six months, pregnant, presented herself at my office, November 3d, suffering from a growth in the left nostril which protruded three-fourths of an inch, was about three-fourths of an inch in diameter, of a dark red color, firm upon pressure, and insensible to ordinary manipulation. Two months previous she had come to me, presenting a small growth in the left nostril, which had all the characteristics of an ordinary gelatinous polypus. Under ordinary circumstances I should have removed it at once; but considering the fact that she was then four months pregnant, and had previously miscarried three times, in each instance with profuse flooding, I feared the shock of an operation and ordered a spray of carbolic solution ( $\frac{1}{100}$ ), under which treatment the growth seemed to disappear, but a month later returned.

Still fearing an operation, on November 9th I injected the tumor with a few drops of glacial acetic acid, and also gave the patient a powder, composed of tannin, to be snuffed up the nostril as best she could. On November 15th, there was little improvement, so I decided upon an operation. To lessen the pain and shock of the operation, I employed the muriate of cocaine, two per cent. solution, applied with a camel's-hair brush, to inside of the nostril, as well as the tumor would permit the insertion of the brush.

I made three applications at intervals of ten minutes, using in all 3 ss. of the solution, or about one grain of cocaine muriate. The first application was rather painful from the contact of the brush, but the subsequent caused no uneasiness. The Jarvis' snare was then applied without any discomfort, and passed well up to the root of the tumor, which seemed to have origin from the middle turbinated bone. No pain was experienced during the operation, and after an hour and a half the tumor came away, the patient not losing more than a few drops of blood during the entire operation, and no hemorrhage followed it.

In addition to the foregoing cases I have employed cocaine to remove polypi and hypertrophied turbinated tissues, and have found it useful to facilitate the practice of posterior rhinoscopy and to alleviate pain in the larynx and pharynx. I do not consider its employment urgent in the removal of polypi and turbinated hypertrophies, since these growths, especially the former, can be in most instances removed with little

or no pain by means of my nasal *écraseur*. The time required to make the operation painless with the snare is necessary also to prevent the occurrence of annoying hemorrhage. Although cocaine at times restrains bleeding, its action in this respect is not necessarily permanent. I have observed tissues pale and bloodless when divided under the influence of cocaine, bleed profusely as soon as the effect wore off. The employment of cocaine in the nostril has been referred to in this country by Bosworth, Bettman, Ingals, Knapp, Gruening, and Claiborne.

It is curious to note that while Professor Wöhler and Dr. Niemann mention its effects upon the tongue, they claimed it possessed no action upon the eye.<sup>1</sup> Von Anrep (*Archives für Physiologie*, p. 56, 1880) experimented upon himself by pencilling the tongue with a weak solution of cocaine, and observed a loss of sensation. The blood-vessels were first constricted, then dilated, and eventually resumed their normal condition. It was probably this discovery that induced Fauvel and other European laryngologists to employ cocaine in examinations of the throat. Although I have only employed a four per cent. preparation of the salt, the experiments of Jelenek<sup>2</sup> indicate an advantage to be obtained by the employment of stronger solutions (twenty and thirty per cent. alcoholic) of the salt. The difference will probably show itself in a deeper and more rapid effect. My remarks upon cocaine analgesia would be incomplete without reference to another agent of this kind. I allude to rhigolene. Although no record of its use in intra-nasal surgery has come under my notice, rhigolene has yielded excellent results in my hands. For the present I must content myself with a brief account of the method, since a detailed description would be foreign to the subject of my paper.

This petroleum naphtha, proposed by Dr. H. J. Bigelow, of Boston, as a local anæsthetic, boils at 70° F., and, in the form of a spray, is capable of reducing the temperature 15° below zero. Rhigolene, when applied with a suitable atomizing apparatus, will effectually freeze the tissues in less than a minute.

I make use of a special contrivance for this purpose. Its action is more prompt and deeper, but of shorter duration than that of cocaine. Cartilage and mucous membrane can be deeply and freely divided without pain or hemorrhage. The rapid disappearance of the artificial congelation makes it necessary for the operator to act with promptness and energy. In cases requiring extensive operative interference, frequently repeated applications of the rhigolene spray are necessary. This, however, does not apply to the practice of *écrasement*. Tissues properly snared with the wire loop of my nasal *écraseur* can be continuously frozen and divided. I have utilized partial cocaine anæsthesia to facilitate transfixion and snaring of the turbinated tissues, rapidly completing the operation with the rhigolene spray. It is hardly necessary to add that daylight must be employed for illumination, on account of the inflammability of the naphtha fumes.

Rhigolene acts more rapidly than ether, and for this and other reasons is to be preferred.<sup>3</sup>

**Conclusions.**—1. Cocaine is useful in intra-nasal surgery, as a local anæsthetic, for the removal of deep as well as superficial tissue abnormalities.

2. Repeated applications are required for the removal of the deeper structures, the time requisite for anæsthesia always being shorter after the first effect has been obtained.

3. By promoting quiet and preventing secretion, hemorrhage, and sneezing, it facilitates the employment of cutting instruments within the nasal cavity.

4. The action of cocaine for profound anæsthesia depends upon the quality and quantity of the salt.

<sup>1</sup> American Journal of Pharmacy, 1860, vol. xxxii., p. 450.

<sup>2</sup> Wiener Medizinische Wochenschrift, No. 45, 1884.

<sup>3</sup> Dictionnaire de Médecine, etc., Littré and Robin.

5. In rhigolene we possess a most valuable local anæsthetic for intra-nasal operations, the effects produced being more rapid and complete but of shorter duration than those of cocaine.

6. Rhigolene is advantageously employed in conjunction with cocaine.

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## FURTHER OBSERVATIONS ON THE USE OF COCAINE.

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SINCE my communication on cocaine and its application, MEDICAL RECORD, October 25th of this year, I have used the new anæsthetic in a considerable number of cases, of which the following may be of interest even after the galaxy of cocaine papers that have appeared in the American and foreign press since October 18th.

CASE I.—*Enucleation of an eyeball under anæsthesia from injecting cocaine into the post-ocular cellular tissue.*

—To-day, at my clinic at the University Medical College, I presented a patient, aged twenty-five years, in whose left eye I had diagnosticated a choroidal sarcoma. I stated before the class that it would be quite an interesting experiment to inject cocaine into the orbit, behind the globe, and afterward test the sensibility of the anterior parts of the eye, supplied by the ciliary nerves. The hour, however, drawing to a close, the practical indications of the case were the only ones we had time to attend to. I instilled two drops of a four per cent. solution of Merck's hydrochlorate of cocaine into the conjunctival sac. Five minutes later another five drops were instilled, and about six minims of the same solution injected behind the globe. This was easily done and not felt at all by the patient. The eyeball had been forcibly drawn toward the nose with a pair of fixing forceps, the point of the hypodermic syringe thrust into the orbital tissue as far as the posterior pole of the globe. Five minutes later the eye was enucleated in the usual way. The patient indicated slight pain at the division of the tendons of the recti muscles. The division of the optic nerve and the dissection of the posterior segment of the globe caused almost no pain. When the eyeball was removed, I thrust the end of the forceps an inch deep into the wound of the orbital cellular tissue. The patient did not move, and said she felt nothing. The bleeding was very scant. The eyeball was opened at once, and a typical melanotic sarcoma of the choroid, the size of a cherry pit, covered by detached retina, was exhibited to the class. Ten minutes later, when the hemorrhage had completely ceased, I united the conjunctival wound with a continuous suture. By this time the sensibility had returned, and the patient screamed at every stitch, saying that this hurt her very much, whereas during the operation she had felt almost no pain.

This observation has convinced me that even the removal of the eyeball does not lie outside the field of application of the new local anæsthetic.

CASE II.—*Ptosis operation after subcutaneous injection of cocaine; anæsthetic effect not very satisfactory.*—A boy aged about ten years, with double congenital ptosis, was operated on at the clinic of the University, November 25th. I injected a few drops of a four per cent. solution of cocaine under the skin of the right upper eyelid, introducing the point of the syringe 3 mm. above the edge of the lid, near the outer commissure, and advancing it horizontally nearly to the inner commissure. In withdrawing the needle, I injected the liquid. The lid swelled slightly, was suffused with blood, and in ten minutes only partially insensible. I held it compressed between a clamp, removed an elliptical piece of skin and muscle, and stitched the lower lip of the wound to the upper, passing the sutures high up through the skin. The tissue which I removed was infiltrated with blood. The patient

had pain during the whole operation, not great in the centre, but quite keen at the periphery of the wound. He was restless and uneasy. I etherized him, which took about one minute, and performed the same operation on the other eye under perfect anæsthesia. The four black silk-sutures which loosely closed each wound were removed to-day, a week later, before the class. There was no trace of suppuration; primary union had taken place in both lids, though the wounds had been protected by nothing more than a clean handkerchief, and the boy had gone home to Harlem immediately after the operation. The result in both eyes is perfect.

CASE III.—*Perforation of drumhead; cocaine anæsthetizes the inner wall of the drum-cavity, but not the drumhead.*—Mr. —, aged twenty-one, a student of medicine, presented himself on October 23d at my office, with a middle-sized, clean-cut perforation in each drumhead. The drumheads, as well as the inner walls of the drum-cavity were quite sensitive to the touch of a probe. Fifteen minutes after the instillation of cocaine, the drumheads had lost nothing of their sensibility, but the inner walls of the drum-cavity were completely anæsthetic. The patient felt a bitter taste in his throat.

CASE IV.—*Cocaine in cataract operations pre-eminently useful.*—Division of primary and secondary cataract is entirely without pain—a great advantage, for it removes also the reflex contraction of the globe, which favors too great a capsular opening in soft cataract, and prolapse of vitreous or of shreds of capsule in secondary cataract. The perfect rest of the eyeball is highly favorable for an exact technique.

In extraction of senile cataract under cocaine, there is only one step connected with pain, viz., the excision of the iris. This pain is commonly not great, and easily borne. The perfect insensibility of the conjunctiva and cornea insures the steadiness of the eyeball, and the correct location of puncture, counter-puncture, and track of the section. The absence of pressure makes accidents, such as falling of iris before the knife, and prolapse of vitreous, less likely to occur. Without going into details, I may say that it assists the operator in every step, but particularly in the so-called toilet of the wound, i.e., its cleansing and final adjustment.

The property of cocaine to contract the blood-vessels, which is of great advantage in operating, has been suspected of having bad after-effects. Dr. G. J. Ball, in the *New York Medical Journal*, November 22, 1884, page 587, makes the following remark: "It became a question whether the new anæsthetic might not impair nutrition in certain operations in which the slightest impairment might affect the result injuriously. In two cases of cataract extraction in which cocaine was employed, the operations had been followed by sloughing of the flap. It might be well to consider whether this was more than a mere coincidence." I think it was not. Since the introduction of cocaine, fifteen successive extractions have been performed under the influence of cocaine at the New York Ophthalmic and Aural Institute. Only one operation was followed by some reaction—it was a complicated operation. The recovery was protracted, but good. The other cases were free from any disturbance both during the operation and the course of healing, and the results were good in all.

I feel sure that in this, the most important operation in ophthalmic surgery, the rate of success will be increased by the introduction of the new anæsthetic, through Dr. C. Koller.

DECEMBER 2, 1884.

THE SHORTEST CLINICAL REPORT ON RECORD.—A correspondent from Warren, O., would like to hear from the profession on the following case: "Man—after swallowing glass of whiskey, chewed and swallowed part of the glass." Correspondent would like to know how it should have been treated.